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**SYSTEM AND METHOD FOR INSPECTING THE STRUCTURAL
INTEGRITY OF VISIBLY CLEAR OBJECTS**

Field of the Invention

This application pertains to the art of inspecting the structural integrity of visibly clear objects. In particular, it relates to the inspection of visibly clear food and/or beverage containers manufactured out of glass or plastic. Though the invention will be described with reference to those items, it should be understood that the invention has a broader application to the inspection of any manufactured or naturally occurring object having a predominately visibly-clear structure.

Background of the Invention

Machine vision systems providing some degree of functionality related to inspecting the structural integrity of visibly clear glass and/or plastic containers have been conceived and constructed. Generally, such systems are based on the operation of an area array sensor, most typically a CCD sensor, sensitive to energy in the visible portion of the electromagnetic spectrum (400nm to 700nm). For purposes of this disclosure, the term visibly clear specifically means that the material allows very high optical transmission of electromagnetic radiation (light) falling within the 400nm to 700nm visible wavelength range.

One fairly obvious but important fact associated with objects manufactured from visibly clear material is that it is difficult, using state-of-the-art machine vision techniques, to inspect such objects for the presence of material voids in their final formed structure. This is significant because material voids such as holes or cracks are critical part defects which compromise the intended function of the product.

Machine vision inspection systems typically operate by measuring the spatial variations of visible light as it reflects off or transmits through the structure. Since the objects which are to be inspected by such state-of-the-art systems are predominately clear in nature, the spatial light intensity variations which result from the presence of material voids in the material structure are quite